



A New *Frankliniella* Species (Thysanoptera, Thripidae) on Gramineae from Korea

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Abstract A new species, *Frankliniella gilva* sp. nov. on Gramineae is described with illustrations of external characters from Korea. The species is distinguishable from other related species by the uniformly pale-yellow body, the prolonged head between compound eyes, five ventral pigmented facets on compound eyes, and the absence of mesosternal spinula.

Key words Taxonomy, *Frankliniella gilva*, New species

INTRODUCTION

Frankliniella Karny, 1910 is the second largest genus in the family Thripidae with about 160 species in the world, most of which were recorded from the Americas, and only seven species are assumed to be native to the Palearctic Region (Nakahara, 1997). The genus includes several species known as agricultural pests by virus transmission as well as by direct feeding. In Korea, four species, *F. intonsa* (Trybom), *F. lilivora* Kurosawa, *F. occidentalis* (Pergande), and *F. tenuicornis* (Uzel) have been reported (Kurosawa, 1937, 1941; Woo *et al.*, 1994).

The genus had been distinguished from other genera by four pairs of long pronotal setae and two continuous rows of veinal setae on forewing for a long time. Recently, Sakimura and O'Neil (1979) and Mound and Nakahara (1993) added many other characters to the generic concept, such as three pairs of ocellar setae and paired lateral ctenidia on abdominal terga VIII anterolateral to the spiracles.

In this paper, we describe a new *Frankliniella* species, *F. gilva* sp. nov. with illustrations of many parts of body. The species was found on gramineous plants including *Miscanthus sinensis* Andersson (Gramineae) in Korea. As described below, this new species has many features unknown or little known in the genus. Prolonged head between compound eyes is reported only from *F. tenuicornis* (Uzel) until now. Furthermore, the absence of mesosternal spinula in the genus is recognized for the first time. Particularly, the species has consistently five pigmented facets on the venter of compound eyes, which may be important for later phylogenetic study. Abbreviations used are as follows: A–antennal segment; d–dorsal; L–length; P–pleurite; S–sternum; s–seta; T–tergum; v–ventral; W–width.

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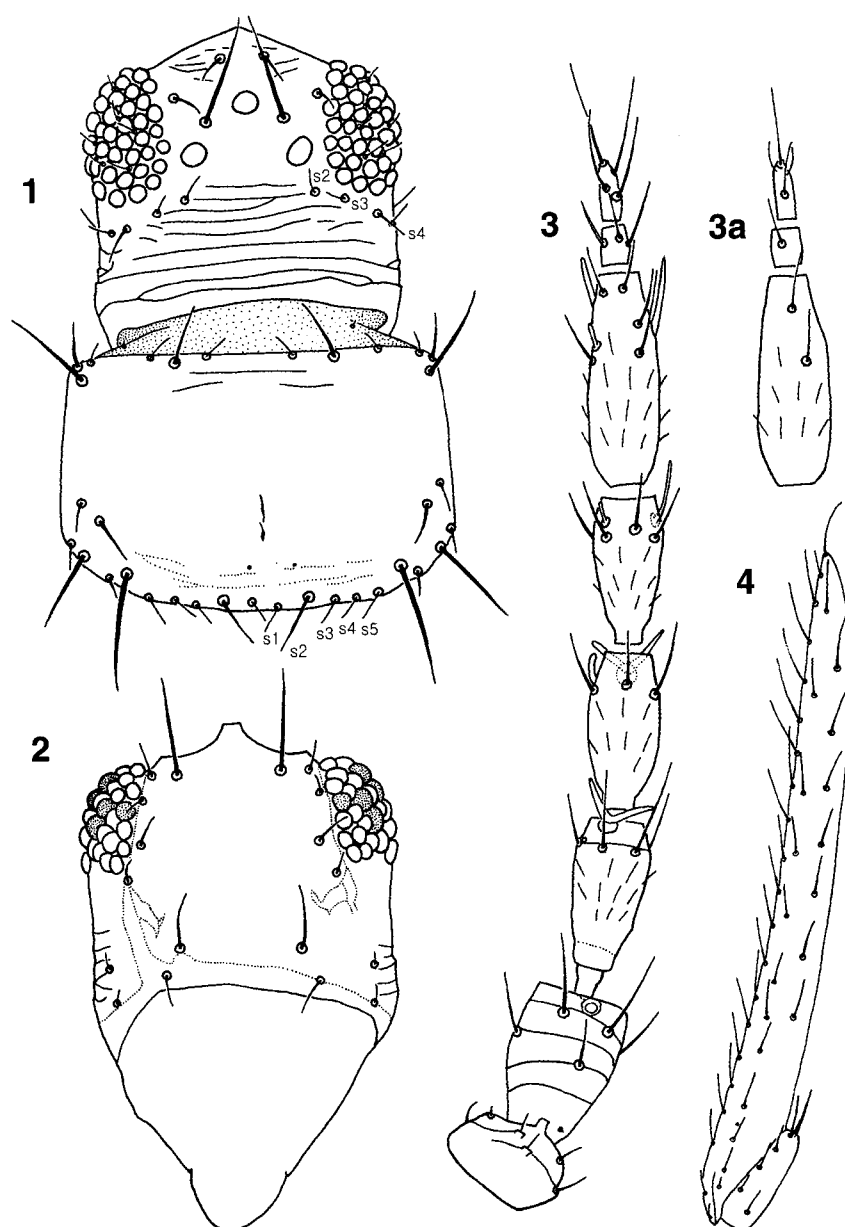
Frankliniella gilva Lee and Woo, sp. nov. 연노랑총채벌레 (신칭)
(Figs. 1–12)

Diagnosis. Body uniformly pale yellow; antennal segments A1 to A5 yellow; forewing not shaded. Head between compound eyes prominently prolonged; compound eyes with five ventral pigmented facets; interocellar setae well developed and inserted just out of ocellar triangle; two pairs of postoculars inner to major setae. Base of outer sense cone on antennal segment A6 not enlarged. Pronotum with four pairs of long setae; disc almost smooth without median setae; five pairs of posteromarginal setae. Upper vein of forewing with less than 14 setae. Metanotum longitudinally and broadly sculptured in distal half; metaepisternum without setae; meso- and metasternal spinula wanting. Abdominal submedian setae on tergum T4 normal; postmarginal comb on tergum T8 complete but almost without teeth on broad and triangular bases; median primary setae on abdominal sternum S7 inserted ahead of posterior margin. Male abdominal sterna S3 to S7 each with a transversely short and narrow gland area.

Description. <Female> Macropterous. Body and legs uniformly yellow. Antennal segments A1 to A5 yellow, A2 and A5 slightly darker; A6 to A8 dark brown, basal half of A6 often pale. Forewing not shaded.

Head (Figs. 1–2) broader than long, its length up to eyes ca. 0.82 times the width across cheeks; prominently prolonged between eyes; anteocular projection weakly developed. Compound eyes not bulged with five ventral pigmented facets. Frontal costa notched. Cheeks almost straight and its basal extreme slightly swollen. Two pairs of anteocellar setae. Interocellar setae well developed, inserted just out of ocellar triangle, and a little closer to hind ocelli than to fore one. Two pairs of postoculars inner to major setae (probably s1 omitted); s2 and s3 short and subequal; major postocular setae (= s4) as long as 1/3 of interocellar setae. Ventral interocular area between anterior tentorial pits and bases of antennae with five pairs of setae. Proboscis moderate in size and rounded apically. Maxillary palps 3-segmented. Antennae (Fig. 3) 8-segmented; A3 with slightly swollen pedicel; A3 and A4 each with a forked sense cone; A4, A5, A6, and A7 each with 1, 2, 3, and 1 linear sense cone; A6 with base of outer sense cone not enlarged, inner sense cone attaining basal 1/3 of A7; A8 slightly longer than A7. Setae on antennal segments: I 6 (+ 2d3v), II 7 (+ 1d), III 5, IV 5, V 6, VI 7, VII 3, VIII 6. Microtrichial rows on antennal segments: I & II absent, III 3–5, IV 2–4, V 2–4, VI 2–4, VII absent, VIII 2v.

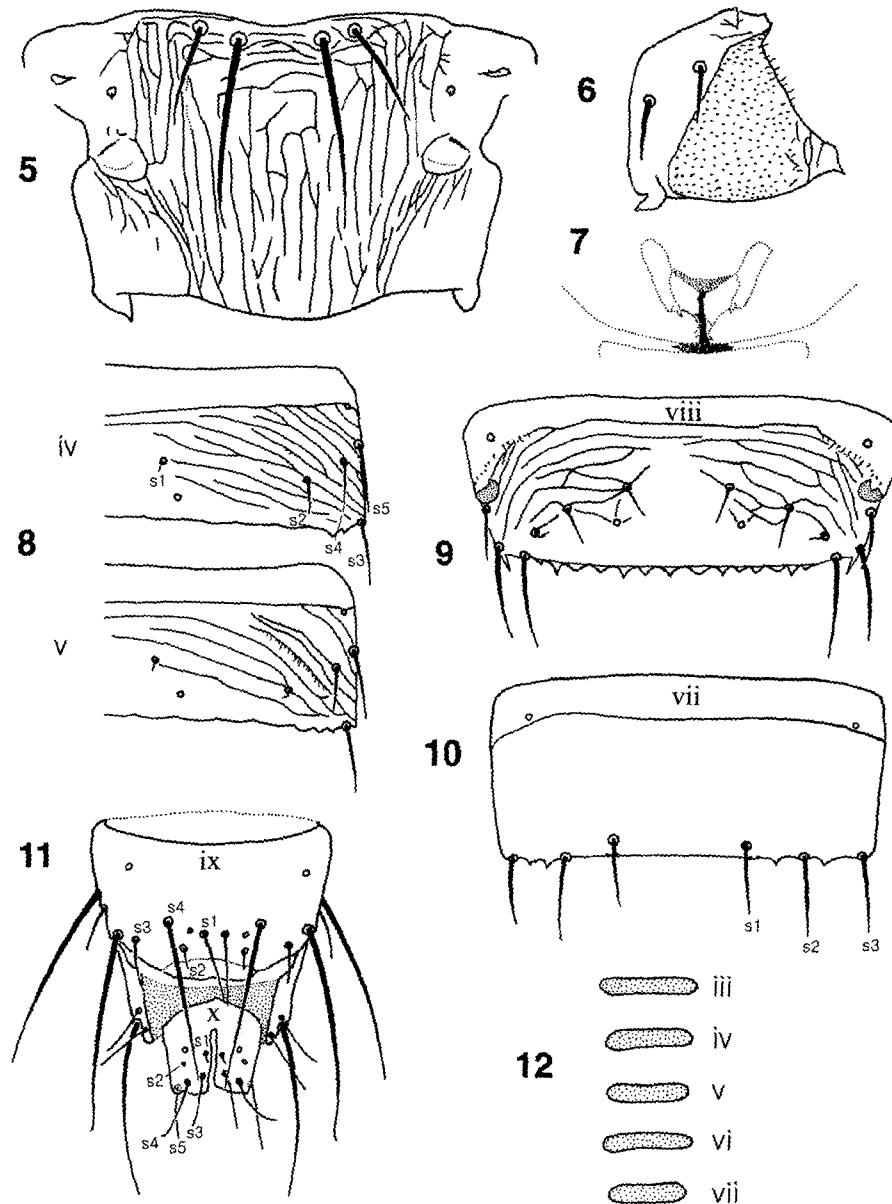
Pronotum (Fig. 1) broader than long, its length ca. 0.64 times as long as the width. Disc of pronotum almost smooth with a few weak lines on anterior extreme. Discal setae very few (4–7 setae) without median setae; sublateral setae slightly developed. Anteromargin and anteroangular each with one pair of long setae; posteroangular with two pairs of long setae, inner ones as long as half of pronotum. Anterior margin between anteromarginal long setae with one pair of small setae. Posterior margin inner to postangulars with five pairs of setae; s2 largest, longer than twice as long as s1; s4 subequal to s3 or s5. Fema entire and undivided; basantra membranous. Mesonotum transversely sculptured, having anamosing lines; a pair of campaniform sensilla present on anterior third; median and submedian setae inserted along posterior margin. Metanotum (Fig. 5) longitudinally and broadly sculptured in distal half; median setae slightly behind anterior margin, closer to outer setae than each other; campaniform sensilla usually absent, rarely with one. Mesoepimeron (Fig. 6) with two setae; its basal extreme with a few transverse sculptures, and rest of anepimeron with dense pubescence of microtrichia. Metaepisternum without setae. Metapreepisternum with two setae. Metaepimeron with two setae. Mesothoracic sternopleural sutures present. Spinula wanting on mesosternum (Fig. 7) as well as on metasternum. Metasternum medially smooth



Figs. 1-4. *Frankliniella gilva* Lee and Wu sp. nov., female: 1. head and pronotum, dorsal; 2. head, ventral; 3. left antenna, dorsal; 3a. antennal segments A6-A8, ventral; 4. right fore wing (microtrichia and fringes not drawn).

with four pairs of primary setae; with 5-8 discal setae. Legs slender and normal. Tarsi 2-segmented.

Forewing (Fig. 4) with wavy posterior fringes. Costa with 18-21 setae. Radius (= upper vein) with less than 14 setae including four basal, its row of setae almost complete. Cubitus (=



Figs. 5-12. *Frankliniella gilva* Lee and Wu sp. nov.: 5-10. female; 11 and 12. male; 5. metascutum; 6. left mesoepimeron; 7. mesosternal furca; 8. abdominal terga T4 and T5 (in part); 9. abdominal tergum T8; 10. abdominal sternum S7 (sculptures not drawn); 11. abdominal terga T9 and T10 (sculptures not drawn); 12. gland areas on abdominal sterna S3-S7.

lower vein) with 6-10 setae. Clavus with four or five veinal and one discal setae.

Abdominal terga (Figs. 8-9) and sterna II to VII transversely sculptured; lines on terga usually attaining median area. Terga T1 to T8 with one pair of median campaniform sensilla inserted far ahead of posterior margin. Tergum T2 with three laterally marginal setae and an

additional seta on laterotergite. Setal formula on terga T3 to T7 2+1m+2+1m; s1 on T3–T7 short; s2 on T5–T7 as well as s4 on T6–T8 reduced and curved inward; s4 on T6–T7 not connected to lateral ctenidia. Terga T4 to T8 with paired lateral ctenidia, on T4 weak or rudimentary; on T8 anterolateral to the spiracles. Postmarginal comb on tergum T8 complete but usually without teeth on broad and triangular bases. Laterotergites separated by sutures. Pleurites P2 to P7 with serrate projections posteriorly. Sterna S1 and S2 with three and three pairs of small anteromedian setae, respectively. Sternum S2 with two pairs of primary setae. Sterna S3 to S7 with three pairs of primary setae. Sternum S7 (Fig. 10) with median primary setae (= s1) inserted a little ahead of posterior margin. Sterna S2 to S7 without discal setae. Postmarginal flanges on terga and sterna absent. Tergum T9 with two pairs of campaniform sensilla. Tergum T10 longitudinally split in about distal four-fifths.

<Male> Macropterous. Body color pale yellow as in female. Abdominal terga T4 to T8 with paired lateral ctenidia. Postmarginal comb on tergum T8 complete as in female. Abdominal sterna S3 to S7 each with a transversely short and narrow gland area (Fig. 12). Sternum S7 with median primary setae inserted on posterior margin. Sternum S8 with postmarginal teeth between primary setae. Discal setae absent on sterna. Tergum T9 (Fig. 11) without any thick seta; s2 far backward to s1 in position. Tergum T10 (Fig. 11) longitudinally split in distal about two-thirds; s1 short, not rudimentary.

Measurements in μm . <Holotype female> Total body length 1472. Head median L (total) 136, L lateral up to anterior margin of eye 122, W at eyes 158, at cheeks 150. Interocellar seta 53 long. Postocular seta s2 13, s3 9, s4 16 long. Maxillary palp 40 long. Antenna total L 260; L (and W) of segments: I 24 (30), II 33 (28), III 43 (20), IV 39 (19), V 35 (18), VI 51 (18), VII 10 (8), VIII 18 (6). Sense cone on antennals III 12, on IV 14 long; inner sense cone on V 16, on VI 20 long. Pronotum L 128, W 199; inner posteroangular seta 59, outer 47 long. Forewing L 684, W at middle 53. Interval between campaniform sensilla on tergum IX 95, between bases of median setae 81. Ovipositor L 244. <Paratype male> Total body length 1165. Antenna 244 long; pronotum L 110, W 173; W (and L) of gland area on the abdominal sterna: III 50 (8), IV 47 (8), V 43 (8), VI 47 (8), VII 40 (8).

Types. Holotype: female, KOREA: Misiryeong, Inje, Gangwon, 20 VI 2001 (GS Lee), by sweeping on herbaceous plants. Paratypes: 3 ♀ 3 ♂: 1 ♀, Haksapyeong, Sokcho, Gangwon, 21 VI 2001 (GS Lee), by beating the leaves of *Miscanthus sinensis* Andersson (Gramineae); 2 ♀ 3 ♂, Hangryeong, Inje with the same data, by beating an unknown gramineous plant. All types are deposited in the Collection of the National Institute of Agricultural Science and Technology (NIAST), Suwon, Korea.

Habitat. On the leaves of gramineous plants including *Miscanthus sinensis* Andersson (Gramineae).

Etymology. The specific name is derived from Latin “gilvus” (= pale–yellow).

Discussion. *Frankliniella gilva* sp. nov. is remarkable by uniformly pale–yellow body, prolonged head between compound eyes, five ventral pigmented facets on compound eyes, two pairs of postoculars inner to major setae, and absence of mesosternal spinula.

The species is closely related to *F. tenuicornis*, of which head between compound eyes is prominently prolonged uniquely. The latter, however, can be easily distinguished from the former by dark brown body, three pairs of postoculars inner to major setae, and presence of mesosternal spinula. Furthermore, the latter has submedian setae on abdominal tergum T4 reduced and median primary setae on S7 inserted on posterior margin, while the new species has normal submedian setae on T4 and median primary setae on S7 inserted far ahead of posterior margin as seen in most of congeners (Sakimura & O'Neill, 1979). In addition, there is a difference in number of pigmented facets between these two species. Although Nakahara (1988) reported that number of facets pigmented in *F. tenuicornis* was three, the Korean

specimens in NIAST shows that it is variable from three to five (among 38 compound eyes examined; three on 8 eyes, four on 18 eyes, and five on 12 eyes). In the other hand, the new species has consistently five pigmented facets (totally 14 compound eyes in all examined).

Up to the present, only five species, *F. lilivora* Kurosawa, *F. pheaner* Hood, *F. schultzei* (Trybom), *F. sulphurea* Schmutz, and *F. tuberosi* Moulton, are known to have five pigmented facets (Nakahara, 1988). Among them, only *F. lilivora* and *F. sulphurea* are grayish or pale-yellow, almost concolorous with the new species. Besides not prolonged head between compound eyes, however, they are differentiated from the new species by antennal segments A2 and A5 brown-colored and postoculars inner to major setae not uniserial in *F. lilivora*, and by interocellar setae inserted between hind ocelli and metanotum medially reticulated in *F. sulphurea*.

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